

CLAIMS

What is claimed is:

1. A polymer bearing non-polymerizable lactone ring wherein the polymer is selected from the group consisting of polyester, polyorthoester, polyphosphoester, polycarbonates, polyanhydrides and polyphosphazenes and copolymers and blends thereof.
2. A polymer bearing non-polymerizable lactone ring according to claim 1 wherein the non-polymerizable lactone ring is within the polymer chain or the non-polymerizable lactone ring is bonded to one or both ends of the polymer chain.
3. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polyester.
4. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polyorthoester.
5. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polyphosphoester.
6. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polycarbonate.
7. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polyanhydride.
8. A polymer bearing non-polymerizable lactone ring according to claim 2, wherein the polymer is a polyphosphazene.
9. A polymer bearing non-polymerizable lactone ring according to claim 3, wherein the polyester is selected from the group consisting of polymers, copolymers or blends of L-lactide, DL-lactide, D-lactide, lactic acid, ϵ -caprolactone, hydroxycaproic acid, p-dioxanone, trimethylene carbonate, 1,5-dioxepan-2-one, 1,4 dioxepan-2-one, glycolide, glycolic acid, ethylene glycol, propylene glycol valerolactone, hydroxyvaleric acid, and butanediol.
10. A polymer bearing non-polymerizable lactone ring according to claim 9, wherein the polyester is selected from the group consisting of L-lactide, DL-lactide, glycolide, and polyethylene glycol and the non-polymerizable lactone ring is selected from the group consisting of hydroxybutyrolactone,

erythrynolactone, isopropylidene ribonolactone, isocitric acid lactone, mannarolactone, sacharrodilactone and glucarodilactone.

11. A polymer bearing non-polymerizable lactone ring according to claim 4, wherein the polyorthoester is obtained from a diketene acetal and a dihydroxy non-polymerizable lactone ring bearing prepolymer.

12. A polymer bearing non-polymerizable lactone ring according to claim 11 wherein the dihydroxy non-polymerizable lactone ring bearing prepolymer comprises a polyester selected from the group consisting of polymers, copolymers or blends of L-lactide, DL-lactide, lactic acid, ϵ -caprolactone, hydroxycaproic acid, p-dioxanone, trimethylene carbonate, 1,5-dioxepan-2-one, 1,4 dioxepan-2-one, glycolide, glycolic acid, ethylene glycol, propylene glycol, valerolactone, hydroxyvaleric acid, and butanediol.

13. A polymer bearing non-polymerizable lactone ring according to claim 5, wherein the polyphosphoester is obtained from (C₁-C₁₈)alkylphosphodichloridates, cycloalkylphosphodichloridates or arylphosphodichloridates and a dihydroxy non-polymerizable lactone ring bearing prepolymer.

14. A polymer bearing non-polymerizable lactone ring according to claim 13 wherein the dihydroxy non-polymerizable lactone ring bearing prepolymer contains a polyester selected from the group consisting of polymers, copolymers or blends of L-lactide, DL-lactide, lactic acid, ϵ -caprolactone, hydroxycaproic acid, p-dioxanone, trimethylene carbonate, 1,5-dioxepan-2-one, 1,4 dioxepan-2-one, glycolide, glycolic acid, ethylene glycol, propylene glycol, valerolactone, hydroxyvaleric acid, and butanediol.

15. A polymer bearing non-polymerizable lactone ring according to claim 8, wherein the polyphosphazene is obtained from poly(dichloro)phosphazene and amino butyrolactone.

16. A polymer bearing non-polymerizable lactone ring according to claim 10, wherein the non-polymerizable lactone ring has been ring opened to its corresponding hydroxycarboxylic acid alkali metal salt.

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17. A polymer bearing non-polymerizable lactone ring according to claim 16, wherein the hydroxycarboxylic acid alkali metal salt is within the polymer chain.

18. A complex comprising a polymer bearing non-polymerizable
5 lactone ring according to claim 1, ionically complexed with a therapeutic agent containing at least one cationic group.

19. A complex comprising a polymer bearing non-polymerizable lactone ring according to claim 17, ionically complexed with a therapeutic agent containing at least one cationic group.

20. A complex according to claim 19, wherein the therapeutic agent is
10 selected from the group consisting of LHRH, somatostatin, bombesin/GRP, calcitonin, bradykinins, galanin, MSH, GRF, amylin, tachykinin, secretin, PTH, CGRP, neuromedin, pTHRP, glucagon, neurotensin, ACTH, PYY, PYY, and TSH, or an analogue or fragment thereof.

21. A complex according to claim 20, wherein the therapeutic agent is
15 a somatostatin analogue selected from the group consisting of H- β -D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH₂, where the two Cys are bonded by a disulfide bond, N-hydroxyethylpiperazinyl-acetyl-D-Phe-Cys-Tyr-D-Trp-Lys-Abu-Cys-Thr-NH₂ where the two Cys are bonded by a disulfide bond or N-
20 hydroxyethylpiperazinyl-ethylsulfonyl-Phe-Cys-Tyr-D-Trp-Lys-Abu-Cys-Thr-NH₂ where the two Cys are bonded by a disulfide bond.

22. A complex according to claim 20, wherein the therapeutic agent is an LHRH analogue of the formula p-Glu-His-Trp-Ser-Tyr-D-Trp-Leu-Arg-Pro-Gly-NH₂.

23. A sustained release composition comprising a complex according
25 to claim 21 wherein the composition is in the form of microparticles, microspheres or rods.

24. A sustained release composition comprising a complex according
30 to claim 22 wherein the composition is in the form of microparticles, microspheres or rods.

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25. A pharmaceutical composition comprising a sustained release composition according to claim 23 having an effective amount of the therapeutic agent and a pharmaceutically-acceptable carrier.

5 26. A pharmaceutical composition comprising a sustained release composition according to claim 24 having an effective amount of the therapeutic agent and a pharmaceutically-acceptable carrier.

10 27. A method of treating or preventing a disease or a condition, which comprises administering a pharmaceutical composition according to claim 25 to a patient in need thereof, wherein said disease or condition is a disease or condition that can be treated by the therapeutic agent in the pharmaceutical composition.

15 28. A method of treating or preventing a disease or a condition, which comprises administering a pharmaceutical composition according to claim 26 to a patient in need thereof, wherein said disease or condition is a disease or condition that can be treated by the therapeutic agent in the pharmaceutical composition.

20 29. A method of administering a pharmaceutical composition according to claim 25 to a recipient, wherein said pharmaceutical composition is administered orally, through the nasal passage, through the pulmonary passage or parenterally.

25 30. A method of administering a pharmaceutical composition according to claim 26 to a recipient, wherein said pharmaceutical composition is administered orally, through the nasal passage, through the pulmonary passage or parenterally.